

## THE SUBGENUS *CHIRONOMUS* OF *CAMPTOCHIRONOMUS* KIEFFER FROM CHINA (DIPTERA, CHIRONOMIDAE)

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**Abstract** The subgenus *Camptochironomus* of *Chironomus* from China is reviewed in this paper. Two new species, *Chironomus* (*Camptochironomus*) *latusus* sp. nov. and *Chironomus* (*Camptochironomus*) *senisetosus* sp. nov., are described and illustrated. *Chironomus* (*Camptochironomus*) *pallidivittatus* and *Chironomus* (*Camptochironomus*) *tentans* are redescribed. A key to the males of the subgenus from China is provided.

**Key words** *Camptochironomus*, *Chironomus*, new species, key, China.

### 1 Introduction

The subgenus *Camptochironomus* was erected by Kieffer in 1918, with *Chironomus subaprilinus* Kieffer [misidentified as *Chironomus tentans* Fabricius, 1805], as the type species (Ashe, 1983; Spies & Saether, 2004). Some authors treated *Camptochironomus* as a separated genus (Pinder, 1978; Albu, 1980; Sasa, 1995), but most of authors regarded it as a subgenus of *Chironomus* (Malloch, 1915; Ashe, 1983; Cranston, *et al.*, 1989; Spies & Saether, 2004). *Camptochironomus* is distinguished from the other subgenus of *Chironomus* by the tergite IX expanded into lobe on each side of anal point and without median anal tergite setae.

According to Martin (2009), five valid species of the subgenus have been recorded in the world: four species in Nearctic Region (*Chironomus* (*Camptochironomus*) *dilutus* Shobanov, Kiknadze & Butler, 1999; *Chironomus* (*Camptochironomus*) *pallidivittatus* (Malloch, 1915); *Chironomus* (*Camptochironomus*) *tentans* (Fabricius, 1805); *Chironomus* (*Camptochironomus*) *vockerothi* Rasmussen, 1984), three species in the Palaearctic Region (*Chironomus* (*Camptochironomus*) *pallidivittatus*; *Chironomus* (*Camptochironomus*) *tentans* and *Chironomus* (*Camptochironomus*) *setivalva* (Shilova, 1957), and two species in the Oriental Region (*Chironomus* (*Camptochironomus*) *pallidivittatus* and *Chironomus* (*Camptochironomus*) *tentans* in Wang *et al.*, 1977).

According to Wang (2000), two species of the subgenus (*Chironomus* (*Camptochironomus*) *tentans* and *Chironomus* (*Camptochironomus*) *pallidivittatus*) have previously recorded from the Oriental China (Wuhan, Hubei Province).

Based on the material from China, in this paper,

the subgenus is reviewed. Two new species are described from China and a key to males of the subgenus from China is provided.

### 2 Materials and Methods

The general morphological terminology follows Sæther (1980). Material examined was mounted on slides following the procedure outlined by Sæther (1969) with 'n' indicating the number of specimens examined. The type specimens are deposited in the College of Life Sciences, Nankai University, Tianjin, China (BDN).

### 3 Species Descriptions

#### 3.1 *Chironomus* (*Camptochironomus*) *latusus* sp. nov. (Figs 1–2)

Holotype male, China, Inner Mongolia Autonomous Region, Wuliangsu Lake, 25 Apr. 1982; Light trap, WANG Xin-Hua (BDN No. 04849).

**Etymology.** From Latin *latus*, broad, wide, refers to broad gonostylus.

**Diagnostic characters.** The new species can be distinguished from other known species of this subgenus by having two acute and strong sclerotic lobes in the lateral sides of the anal point and extraordinary plump and broad gonostylus.

Male imago ( $n=1$ ).

Total length 7.18 mm. Wing length 3.90 mm. Total length / Wing length 1.84. Wing length / length of profemur 2.08.

**Coloration.** Head, thorax and abdomen yellowish brown. Hypopygium brown. Front legs: femur yellowish, tibia and tarsomeres dark brown. Mid and hind legs: femur and tibia yellowish, tarsomeres dark brown.

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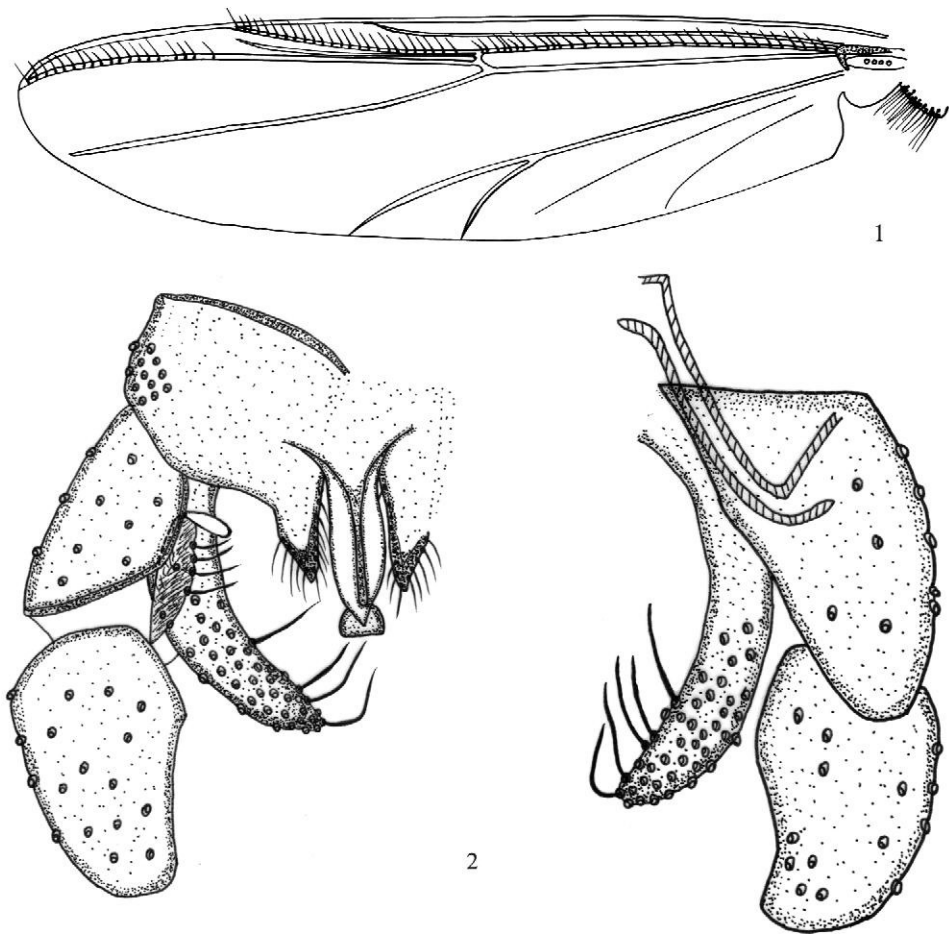
Head. With 21 temporal setae. Clypeus with about 60 setae. Frontal tubercles well developed, column shaped, 30  $\mu\text{m}$  long, 18  $\mu\text{m}$  wide. AR 2.3. Tentorium 218  $\mu\text{m}$  long, 68  $\mu\text{m}$  wide. Palpomeres lengths (in  $\mu\text{m}$ ): 95; 63; 200; 185; 253. 5<sup>th</sup>/3<sup>th</sup> 1.27.

Thorax. Dorsocentrals 18 setae. Acrostichals 2. Prealars 12. Scutellum with 14 setae.

Wing. (Fig. 1) VR 1.05. Costa not extended. Squama with 16 setae, R with 33, R<sub>1</sub> with 25, R<sub>4+5</sub> with 19 setae.

Legs. Pseudospurs well developed, 1 on tarsomere 1 of mid leg, 1 on tarsomere 4 of mid leg, 2 on tarsomere 1 of hind leg, 2 on tarsomere 2 of hind leg, 1 on tarsomere 3 of hind leg, 1 on tarsomere 4 of hind leg. Mid and hind tarsomere 1 with sensilla chaetica on apical 1/2, 9 on mid tarsomere 1, 11 on hind tarsomere 1. Mid and hind tibiae with numerous closely approximated combs, each bearing strong spur. Length ( $\mu\text{m}$ ) and proportions of legs see Table 1.

Table 1. Length ( $\mu\text{m}$ ) and proportions of legs of <i>Chironomus</i> ( <i>Camptochironomus</i> ) <i>latusus</i> sp. nov.														
	Fe	Ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>	LR	BR	BV	SV	Spur <sub>1</sub>	Spur <sub>2</sub>	W. Ti
P <sub>1</sub>	1 875	1 725	2 025	1 125	950	775	375	1.17	0.83	1.74	1.78			
P <sub>2</sub>	1 800	1 850	800	500	400	300	250	0.43	0.76	3.07	4.56	27.5	25	142.5
P <sub>3</sub>	2 075	2 150	1 100	625	525	350	275	0.51	0.62	3.00	3.84	27.5	30	137.5



Figs 1 – 2. *Chironomus* (*Camptochironomus*) *latusus* sp. nov., male imago. 1. Wing. 2. Hypopygium, dorsal and ventral views.

Hypopygium (Fig. 2). Two acute and strong sclerotic lobes located in the lateral sides of the anal point, Laterostern IX with 12 setae. Phallapodeme 307  $\mu\text{m}$  long; transverse sternapodeme 80  $\mu\text{m}$  long. Superior volsellae curved ventrally toward the apex, 73  $\mu\text{m}$  long and 23  $\mu\text{m}$  wide. Inferior volsella 426  $\mu\text{m}$  long, with densely setae on apical 2/3. Gonocoxites

485  $\mu\text{m}$  long, 376  $\mu\text{m}$  wide. Gonostylus extraordinary robust and broad, inner margin slightly concave, without setae. HR 1.29, HV 1.91; Remarks. This new species is close to *Chironomus* (*Camptochironomus*) *pallidivittatus* in the structure of hypopygium, but can be separated by the combined characters in Table 2.

Distribution. The new species was collected in

Inner Mongolia Autonomous Region ( Palaearctic China ).

**Table 2. The discrimination between *C. (C.) latusus* sp. nov. and *C. (C.) pallidivittatus*.**

	<i>C. (C.) latusus</i>	<i>C. (C.) pallidivittatus</i>
Number of brachiolium setae	4	2
AR	2.30	3.02
Lobes flanking anal point	Strong sclerosis	Without sclerosis
Shape of apical gonostylus	Plump	Acuate

### 3.2 *Chironomus (Camptochironomus) pallidivittatus* (Malloch) (Figs 3 – 4)

*Tendipes tentans* var. *pallidivittatus*, Malloch, 1915: 445.

*Camptochironomus pallidivittatus* (Malloch), Pinder, 1978: 111; Albu, 1980: 101.

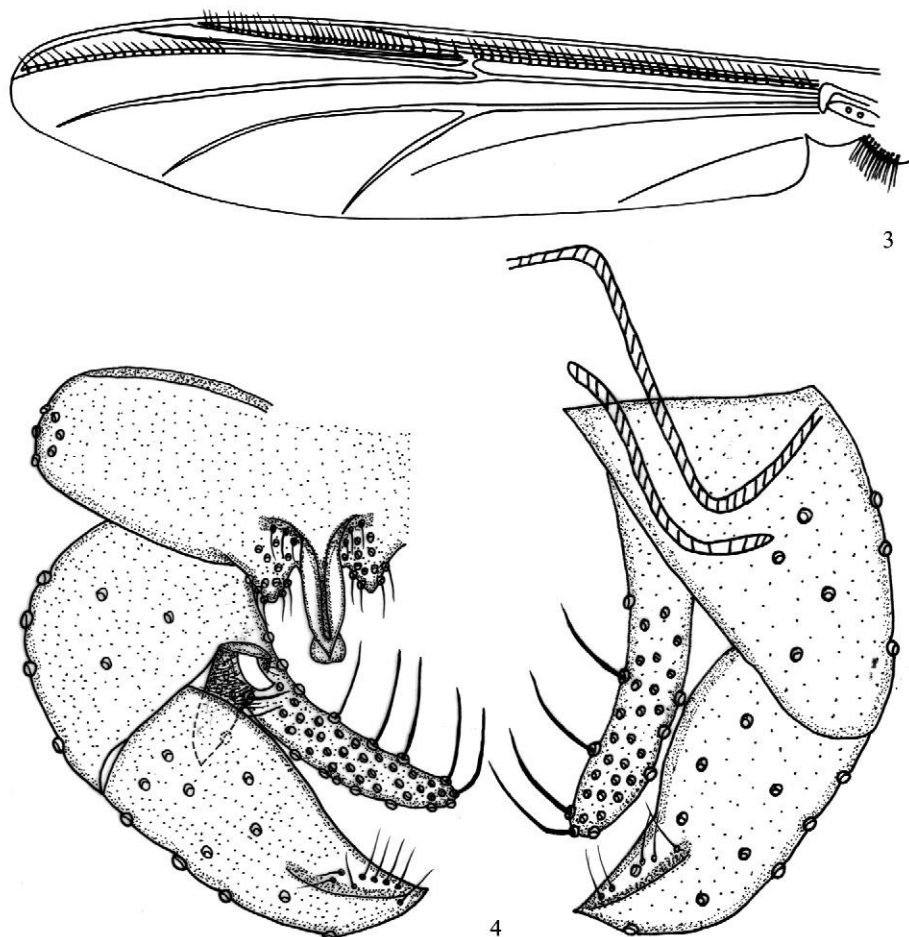
*Chironomus (Camptochironomus) pallidivittatus* (Malloch), Edwards, 1929: 382; Wang S-D *et al.*, 1977: 233, Wang, 2000: 642.

**Material examined.** 1 male, China, Inner Mongolia Autonomous Region, Wuliangsu Lake, 20

Apr. 1982, light trap, WANG Xin-Hua.

**Remarks.** The species was described in detail by Edwards (1929), Wang S-D *et al.* (1977) and Albu (1980). The presently examined specimen has slightly lower AR 3.02 ( $n = 1$ ), LR1 1.32 ( $n = 1$ ), longer wing 4.13 mm than the description by Wang S-D *et al.* (1977) based on the specimens from Wuhan (AR 3.26, LR1 1.43, wing length 3.6 – 4.0 mm). Meanwhile, the presently examined specimen has higher AR than European specimens (AR 2.28 – 2.60). The additional measurements are: HR 1.26, BV1 1.75, BV2 3.15, BV3 2.88, SV1 1.58, SV2 4.49, SV3 3.69, BR1 0.86, BR2 1.11, BR3 1.33, Palpomere length  $5^{\text{th}}/3^{\text{rd}}$  1.19.

The species is known from the Nearctic, Palaearctic and Oriental regions (Malloch, 1915; Edwards, 1929 and Wang S-D *et al.*, 1977). It is here recorded from the Palaearctic China for the first time.



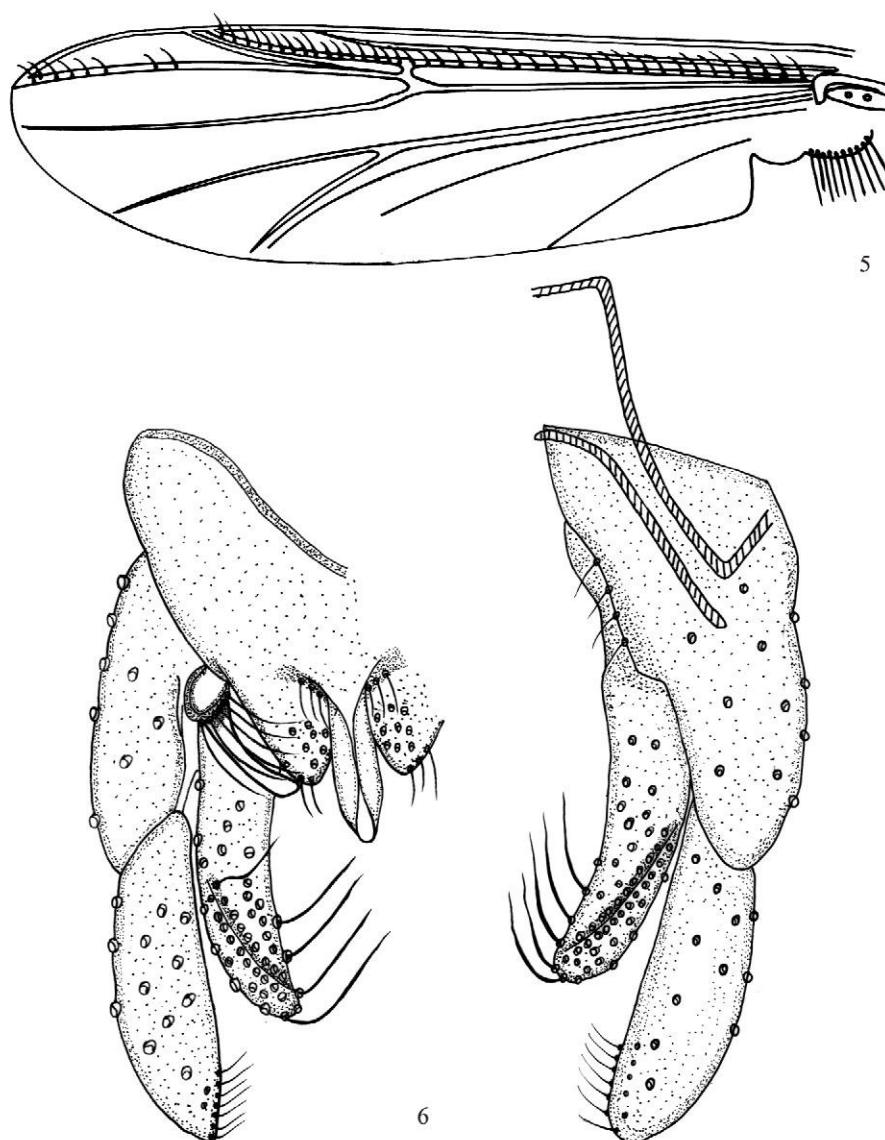
Figs 3 – 4. *Chironomus (Camptochironomus) pallidivittatus* (Malloch), male imago. 3. Wing. 4. Hypopygium, dorsal and ventral views.

### 3.3 *Chironomus (Camptochironomus) senisetosus* sp. nov. (Figs 5 – 6)

**Holotype male**, China, Guizhou Province, Luodian County (25.4° N, 106.7° E), 11 Aug.

2004; Sweeping net, YU Xin (BDN No. 04849).

**Etymology.** From Latin *seni*, means six, *setosus*, means seta, refers to six setae around the base of superior volsella.



Figs 5 – 6. *Chironomus* (*Camptochironomus*) *senisetosus* sp. nov., male imago. 5. Wing. 6. Hypopygium, dorsal and ventral views.

**Diagnostic characters.** The new species can be distinguished from other known species of the subgenus by the following characters: superior volsella large, 6 long and orderly setae around the base of superior volsella, frontal tubercles small, laterostern IX setae absent.

Male imago ( $n = 1$ ).

Total length 5.0 mm. Wing length 2.43 mm. Total length / Wing length 2.06. Wing length / length of profemur 2.02.

**Coloration.** Head and abdomen yellowish brown. Thorax brown. The tarsomeres 3 – 5 of all legs dark brown, the femur, tibia and the first two tarsomeres yellowish.

**Head.** With 18 temporal setae. Clypeus with 20 setae. Frontal tubercles column shaped, small, 8  $\mu\text{m}$  long, 6  $\mu\text{m}$  wide, and 28  $\mu\text{m}$  apart from each other.

AR 2.97. Tentorium 158  $\mu\text{m}$  long, 50  $\mu\text{m}$  wide. Palpomeres lengths (in  $\mu\text{m}$ ): 55: 55: 160: 152. 5: 205. 5<sup>th</sup>/3<sup>th</sup> 1.28.

**Thorax.** Dorsocentrals 9. Acrostichals 4. Prealars 6. Scutellum with 3 setae.

**Wing.** (Fig. 5) VR 1.11. Squama with 10 setae, R with 23, R<sub>1</sub> with 16, R<sub>4+5</sub> with 8 setae.

**Legs.** Pseudospurs well developed, 2 on tarsomere 1 of mid leg, 2 on tarsomere 2 of mid leg, 1 on tarsomere 1 of hind leg, 1 on tarsomere 2 of hind leg. Mid and hind tarsomere 1 with sensilla chaetica on apical 1/2. 12 on mid tarsomere 1, 8 on hind tarsomere 1. Length ( $\mu\text{m}$ ) and proportions of legs see Table 3.

**Hypopygium** (Fig. 6). Laterostern IX setae absent. Phallapodeme 210  $\mu\text{m}$  long; transverse sternapodeme 100  $\mu\text{m}$  long. Superior volsella large, 110  $\mu\text{m}$



Table 3. Length (  $\mu\text{m}$  ) and proportions of legs of *Chironomus* ( *Camptochironomus* ) *senisetosus* sp. nov.

	Fe	Ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>	LR	BR	BV	SV	Spur <sub>1</sub>	Spur <sub>2</sub>	W. Ti
P <sub>1</sub>	1 175	875	1 325	800	725	675	300	1. 51	1. 857	1. 35	1. 55			
P <sub>2</sub>	1 175	1 075	475	275	250	175	125	0. 44	1. 727	2. 76	4. 74	32. 5	32. 5	87. 5
P <sub>3</sub>	1 300	1 275	700	412. 5	375	225	162. 5	0. 55	3. 04	2. 79	3. 68	27. 5	27. 5	105

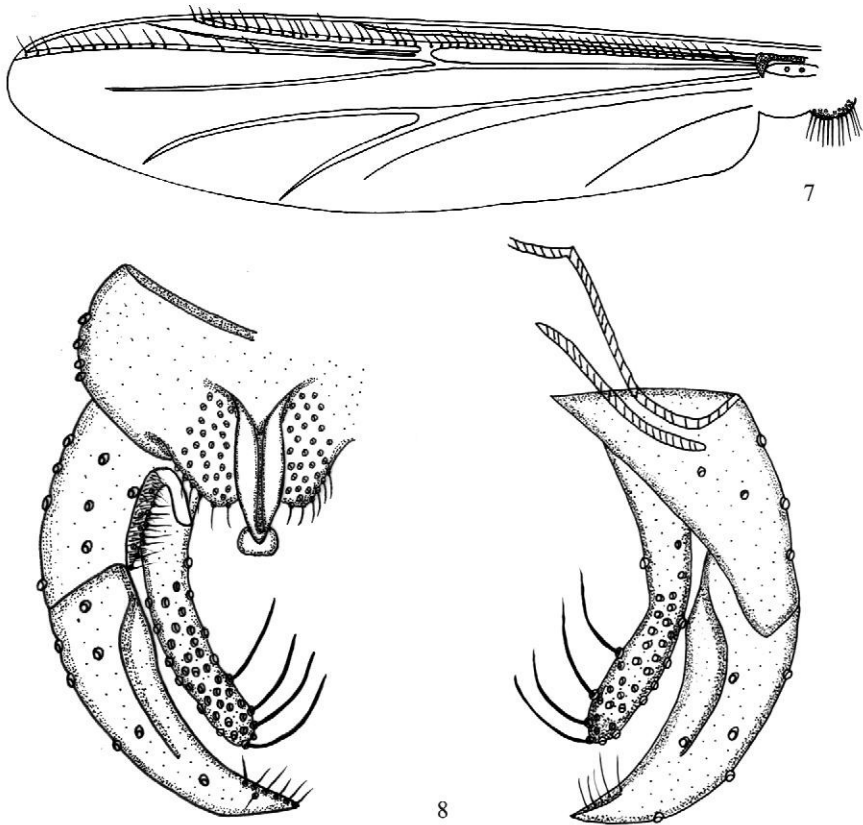
long, 40  $\mu\text{m}$  wide, and curved ventrally toward the apex, base part of superior volsella with 6 long and orderly setae. Inferior volsella 257  $\mu\text{m}$  long, with about 45 setae on apical 2/3. Gonocoxites large and well developed, 356  $\mu\text{m}$  long; Gonostylus long and narrow, 238  $\mu\text{m}$  long. HR 1. 5, HV 2. 1.

Remarks. This new species is close to *Chironomus* ( *Camptochironomus* ) *tentans* in the shape of hypopygium but can be separated the characters in Table 4.

Distribution. The new species was collected in Luodian County in Guizhou Province. ( Oriental China ).

Table 4. The discrimination between *C.* ( *C.* ) *senisetosus* sp. nov. and *C.* ( *C.* ) *tentans*.

	<i>C.</i> ( <i>C.</i> ) <i>senisetosus</i> sp. nov.	<i>C.</i> ( <i>C.</i> ) <i>tentans</i>
Total length / Wing length	2. 06	1. 69 – 1. 79
Number of squama setae	10	19 – 25
AR	2. 97	3. 30 – 3. 78
Setae in laterosternite IX	Absent	4 – 12
Setae in superior volsella	6 orderly setae around superior volsella	Setae disordered
The shape of apical gonostylus	Slightly acuate	Pointed



Figs 7 – 8. *Chironomus* ( *Camptochironomus* ) *tentans* ( Fabricius ), male imago. 7. Wing. 8. Hypopygium, dorsal and ventral views.

3.4 *Chironomus* ( *Camptochironomus* ) *tentans* Fabricius ( Figs 7 – 8 )

*Chironomus tentans* Fabricius, 1805: 38.  
*Camptochironomus tentans* ( Fabricius ), Pinder, 1978: 111.  
*Chironomus* ( *Camptochironomus* ) *tentans* Fabricius, Edwards, 1929: 382;  
Wang S-D *et al.*, 1977: 233. Wang, 2000: 642.

Material examined. 1 male, China, Tianjin City, Nankai University, 19 Apr. 1985, light trap, WANG

Xin-Hua; 1 male, Gansu Province, Dunhuang City, 17 June 1993, light trap, WANG Xin-Hua; 2 males, Ningxia Hui Autonomous Region, Yinchuan Agricultural College, 7 Apr. 1981, light trap, WANG Xin-Hua.

Remarks. The species was described in detail by Edwards (1929) and Wang S-D *et al.* (1977). The

presently examined specimens has slightly lower  $LR_1$  1.16 – 1.30, 1.23 ( $n = 3$ ) than the specimens from Oriental China ( $LR_1$  1.34),  $AR$  3.30 – 3.78, 3.55 ( $n = 4$ ), wing length 4.10 – 5.00, 4.41 mm ( $n = 4$ ), and total length 7.33 – 8.44, 7.65 mm are similar to the latter ( $AR$  3.34, wing length 4.20 mm, total length 7.70 mm). The additional measurements are:  $HR$  1.06 – 1.23, 1.15 ( $n = 4$ ),  $BV_1$  1.74 – 1.78 ( $n = 2$ ),  $BV_2$  2.99 – 3.04, 3.02 ( $n = 4$ ),  $BV_3$  2.72 – 2.84, 2.81 ( $n = 4$ ),  $SV_1$  1.55 – 1.73, 1.65 ( $n = 3$ ),  $SV_2$  4.00 – 4.71, 4.39 ( $n = 4$ ),  $SV_3$  3.33 – 3.93, 3.65 ( $n = 4$ ),  $BR_1$  0.94 – 3.17, 1.74 ( $n = 3$ ),  $BR_2$  0.74 – 1.08, 0.94 ( $n = 4$ ),  $BR_3$  1.14 – 2.19, 1.79 ( $n = 4$ ), Palpomere length  $5^{th}/3^{rd}$  1.05 – 1.36, 1.18 ( $n = 4$ ).

This species is widely distributed in the Holarctic region and the Oriental China. This paper records the species from the Palaearctic China for the first time.

#### Key to species of *Chironomus* (*Camptochironomus*) Kieffer from China (male).

1. Two lobes flanking anal point sclerosis, gonostylus extraordinary plump, broad ..... *C. (C.) latusus* sp. nov.  
Two lobes flanking anal point not sclerosis, gonostylus normal ... 2
2. Laterostern IX without setae, superior volsella large, 6 long and orderly setae around the base of superior volsella .....  
..... *C. (C.) senisetosus* sp. nov.  
Laterostern IX present setae, superior volsella small, disordered setae not around superior volsella ..... 3
3. Two lobes flanking anal point plump, gonostylus slender .....  
..... *C. (C.) tentans*  
Two lobes flanking anal point acute, gonostylus robust .....  
..... *C. (C.) pallidivittatus*

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## 中国双叶摇蚊亚属记述 (双翅目, 摇蚊科, 摇蚊属)

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**摘要** 对中国摇蚊属的双叶摇蚊亚属作了系统学记述。描述了2个新种: 宽铗双叶摇蚊 *Chironomus (Camptochironomus) latusus* sp. nov. 和六毛双叶摇蚊 *Chironomus (Camptochironomus) senisetosus* sp. nov., 重新描述了苍白双叶摇蚊 *Chironomus (Camptochironomus) pallidivittatus* 和伸展双叶摇蚊 *Chironomus (Camptochironomus) tentans*。并编制了中国本亚属4种雄成虫分种检索表。

**宽铗双叶摇蚊, 新种** *Chironomus (Camptochironomus) latusus* sp. nov. (图1~2)

雄虫生殖节构造与苍白双叶摇蚊相似, 但本种肛尖两侧

**关键词** 摇蚊属, 双叶摇蚊亚属, 新种, 检索表, 中国.

**中图分类号** Q969.442.6

叶强烈骨化, 抱器端节明显宽大。AR 值明显小于后者 (表2)。

正模 ♂, 内蒙古乌梁素海, 1982-04-25, 王新华灯诱。

**六毛双叶摇蚊, 新种** *Chironomus (Camptochironomus) senisetosus* sp. nov. (图5~6)

雄虫生殖节构造与伸展双叶摇蚊相似, 但可借以下特征区别于后者 (表4): 上附器发达, 6根长刚毛有序地围绕并着生在上附器基部, 肛节侧片毛缺失, 腋瓣缘明显少于后者。

正模 ♂, 贵州省罗甸县, 2004-08-11, 于昕网捕。

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